

NOTES ON THE ACANTHOCEPHALAN FAUNA OF JAPAN

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FOUR FIGURES

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So far as we are aware, the first report on the Japanese Acanthocephala was published in 1920 by Prof. T. Fujita. He reported three species of fish Acanthocephala. Dr. Van Cleave (1925, 1931), Prof. Harada (1928, 1929, 1935), Fukui, the senior author (1929), Dr. Yamaguti (1935) followed him, and published some important papers. Subsequently, we reported some new species in four papers, two published in 1936 and two in 1937:

According to these papers, the following 42 species are hitherto known from Japan:

Neoechinorhynchidae

Neoechinorhynchus agilis (Rud., 1819)

Neoechinorhynchus zacconis Yamaguti, 1935

Pallisentis celatus (Van Cleave, 1928)

Centrorhynchidae

Centrorhynchus corvi, 1929

Centrorhynchus elongatus Yamaguti, 1935

C. *itatsinis* Fukui, 1929

C. *magnus* Fukui, 1929

C. *microrchis* Fukui, 1929

Porrorchis elongatus Fukui, 1929

Porrorchis ogatai Fukui et Morisita, 1936

Bolbosoma turbinella (Dies., 1851)

Bolbosoma thunni Harada, 1935

Polymorphus capellae Yamaguti, 1935

Diplospiniifer serpenticola Fukui, 1929

Rhadinorhynchus japonicus Fujita, 1920

Rhadinorhynchus katsuwonis Harada, 1928

R. *trachuri* Harada, 1935

R. *aspinosus* Fukui et Morisita, 1937

Rhadinorhynchoides miyagawai Fukui et Morisita, 1937

Southwellina hispida (Van Cleave, 1925)

Echinorhynchidae

Acanthocephalus echigoensis Fujita, 1920

Acanthocephalus nanus Van Cleave, 1925

A. *lucidus* Van Cleave, 1925

A. *gotoi* Van Cleave, 1925

A. *minor* Yamaguti, 1935

A. *opsarichthydis* Yamaguti, 1935

Acanthocephaloides rhinoplagusiae Yamaguti, 1935

Echinorhynchus gadi Müll., 1776

Echinorhynchus kushiroensis Fujita, 1921

Echinorhynchus parasiluri Fukui, 1929

E. *cotti* Yamaguti, 1935

Filisoma japonicum Fukui et Morisita, 1935

Longicollum pagrosomi Yamaguti, 1935

Longicollum alemniscus (Harada, 1935)

- Tenuiproboscis misgurni* Yamaguti, 1935 *Micracanthorhynchus motomurai* Harada, 1935
Corynosoma osmeri Fujita, 1921 *Corynosoma semerme* (Forsell)?
C. ambispinigerum Harada, 1935 *Arhythmorhynchus fusiformis* Yamaguti, 1935
Heterosentis plotosi Yamaguti, 1935
 Gigantorhynchidae
Macracanthorhynchus hirudinaceus (Pallas, 1781).

In the following we shall give descriptions of some of the species mentioned above, with notes which seem to interest the specialists of this group.

Rhadinorhynchus aspinosus Fukui et Morisita

Zikken-Igaku-Zasshi (Japanese Journal of Experimental Medicine) Vol. 21, No. 1, pp. 36-41, pl. 1-3, 1937.

Body cylindrical, tapering posteriorly. Body length 12.4 mm, width 0.96 mm at the anterior part of the trunk. Body wall thick, without spines on trunk. Proboscis long, cylindrical, 0.93 mm in length and 0.25 mm in width. Proboscis hooks in 18 rows and 17 hooks in each row; the hooks are longer on ventral than on dorsal side; the root of hooks turns posteriorly.

From the base of proboscis	H ₁	H ₂	H ₃	H ₄	H ₅	H ₆	H ₇	H ₈	H ₉	H ₁₀	H ₁₁	H ₁₂	H ₁₃	H ₁₄	H ₁₅	H ₁₆	H ₁₇	
Ventral	45.0	45.0	46.5	46.5	48.0	52.0	53.5	60.0	60.0	58.5	60.0	60.0	60.0	60.0	61.5	60.0	60.0	in μ
Dorsal	45.0	45.0	45.0	46.0	46.0	48.0	50.0	53.5	55.0	55.0	53.5	55.0	55.0	60.0	60.0	58.5	60.0	

Posterior part of the proboscis without hooks and 0.05 mm in length. Aspinous neck follows it and 0.35 mm in length. Proboscis sheath cylindrical, double-walled, 2.3×0.26 mm in size. Ganglion oval, situated in the middle of the sheath and 0.23×0.14 mm in size. Lemnisci paired, club-shaped, 1.49×0.21 mm in size, shorter than proboscis sheath.

Male organs situated posterior to the middle of the body. Testes ellipsoidal, arranged tandem, overlapping slightly. Anterior testis 0.91×0.4 mm, posterior one 0.84×0.42 mm in size. Cement glands four in number, arranged in two rows and the anterior part touches the posterior testis. Säftigen's pouch situated closely behind cement glands and 1.4 mm in length. Seminal vesicle is found anterior to the muscular cap. Two elevations are found in the anterior part of the muscular cap and a penis is situated between them. The number of the digitiform rays is uncertain. Bursa copulatrix well developed.

Material. 1 male specimen.

Host. *Teuthis fuscescens* (Jap. name "Aigo"), intestine.

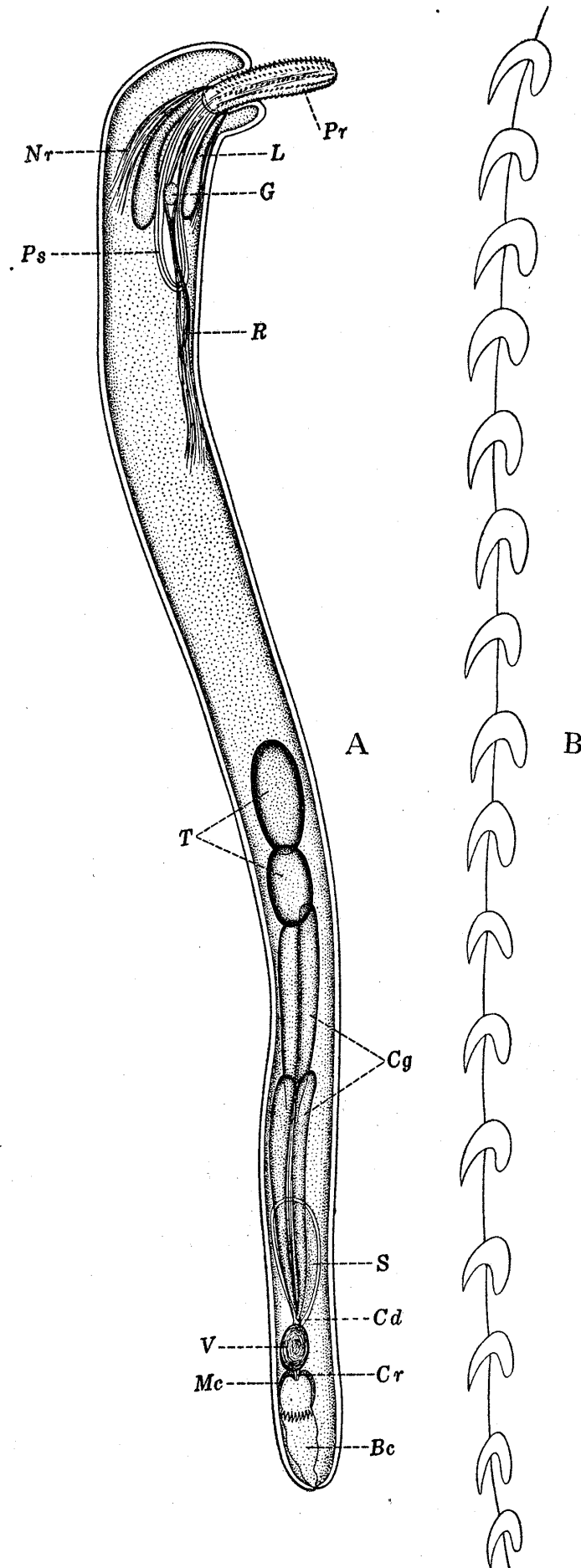


Fig. 1.

Rhadinorhynchus aspinosus
Fukui et Morisita.

A. A male specimen,
12.4 mm long.

B. A row of proboscis hooks.

Locality. Momotori-mura, Sima-gun, Mie Prefecture.

Collector. Morisita.

This species appears to belong to *Tenuisentis* Van Cleave at a glance, but the form of the cement glands and other characters are quite different. The character, having no spine on the trunk, is different from all the known species of *Rhadinorhynchus*, and according to the recent classification which allows so many genera based on some slightly different characters, this species could be classified under a new genus. But since the material is only 1 male specimen, we include this in the genus *Rhadinorhynchus*, and name it *Rhadinorhynchus aspinosus* according to the characters mentioned above.

Rhadinorhynchoides miyagawai Fukui et Morisita

Zikken-Igaku-Zasshi (Japanese Journal of Experimental Medicine) Vol. 21, No. 12, pp. 1841-1848, pl. 1, 1937.

Body cylindrical, tapering posteriorly. The size of the body 7.5×1.2 mm in one male specimen, 18.0×1.2 mm in one mature female, and 9.0×0.75 mm in one immature female. Proboscis cylindrical, 0.51×0.3 mm in size. Proboscis hooks in 15 rows, with 5 hooks in each row. The arrangement of hooks is quincuncial. Posterior part of proboscis naked, and continues to neck. Neck 0.11 mm long. Hooks somewhat longer on ventral than on dorsal side.

From anterior to posterior	H ₁	H ₂	H ₃	H ₄	H ₅	in μ
Ventral	83	83	98	105	105	
Dorsal	75	83	98	98	105	

Proboscis sheath cylindrical, double-walled, 1.05×0.18 mm in size. Ganglion situated in the middle of the sheath. Lemnisci paired, cylindrical, 0.97×0.18 mm in size, being as long as the proboscis sheath or somewhat shorter.

Male organs situated chiefly in the posterior half of the body. Testes arranged tandem, situated close to each other. The size of each testis is about 0.63×0.42 mm. Cement glands four in number, situated closely posterior to testis. Each gland almost equal in length, measuring 2.45 mm. Säfttgen's pouch 1.1×0.53 mm in size. Bursa copulatrix 0.78 mm in length.

Ovary spherical, uterus and uterine bell 1.8 mm in length.

The size of the mature egg is $87.5 \times 22.5 \mu$. The middle shell with polar swelling, $77.0 \times 21.0 \mu$ in size, while the inner shell $61.5 \times 19.0 \mu$

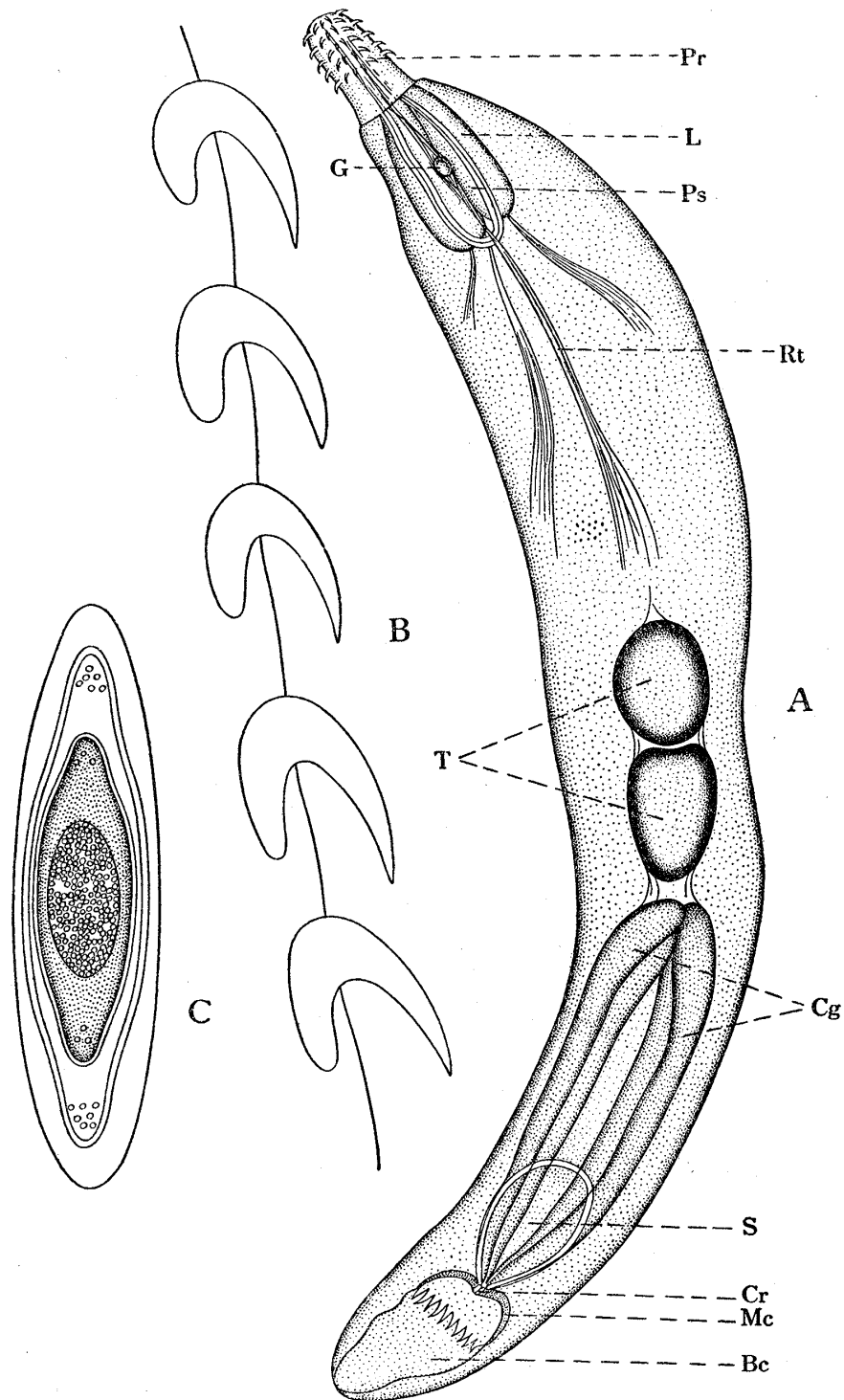


Fig. 2. *Rhadinorhynchoides miyagawai* Fukui et Morisita.

A. A male specimen, 8.1 mm long.

B. A row of proboscis hooks.

C. An egg, $87.5 \times 22.5 \mu$ in size.

and the embryo $52.5 \times 17.5 \mu$.

Material. 1 male and 2 female specimens.

Host. *Salvelinus malma* (Jap. name "Iwana"), intestine.

Locality. The River Taguti, Sekikawa, Nakôyama-mura, Nakakubiki-gun, Niigata Prefecture.

Collector. Mr. Siro Komamura.

Rhadinorhynchoides Fukui et Morisita, 1937

Generic diagnosis: Centrorhynchidae. Body cylindrical, without spines on trunk and neck. Proboscis cylindrical. Proboscis hooks larger on ventral than on dorsal side, and on posterior than on anterior part. Proboscis sheath cylindrical, double-walled, with ganglion in the middle. Lemnisci finger-like, as long as, or somewhat shorter than, proboscis sheath. Testes in the middle of the body, arranged tandem. Cement glands four in number, elongate, parallel. Ovary spherical. Uterus and uterine bell short. Middle shell of egg elongate on both ends. Inner shell remarkable. Parasitic on fish.

Genotype: *R. miyagawai*.

This genus closely resembles *Leptorhynchoides* Kostylev, 1914, but differs from the latter in the shape and number of cement glands. From *Tenuisentis* Van Cleave this genus differs in the shape of cement glands and proboscis sheath.

Filisoma japonicum Fukui et Morisita

Zoological Magazine Vol. 48, Nos. 8, 9, 10, pp. 759-764, 1936.

This species was reported in 1936 on two female specimens. Later we got more materials which contained some males, so we give here a full description of the species.

Body cylindrical, tapering posteriorly, ca. 8.53×0.7 mm in male and $11.5-12.5 \times 0.98$ mm in female. Without spines on trunk. Proboscis cylindrical, about $0.58-0.64 \times 0.1-0.14$ mm in size. Proboscis hooks in 11-12 rows, with 25 hooks in each row. Proboscis sheath cylindrical, $0.79-1.05 \times 0.15-0.56$ mm in size, double-walled. Ganglion oval, situated at the posterior end of the sheath, and ca. $0.13-0.19 \times 0.05-0.09$ mm. Lemnisci paired, long, digitiform, $1.5-1.79 \times 0.09-0.13$ mm in size. Male organs situated in the posterior half of the body. Testes arranged tandem, somewhat overlapping each other. The size of each testis is about 0.91×0.44 mm. Cement glands pear-shaped, six in number, arranged in two sets each containing three. Cement ducts fuse in two sets. The size of each cement gland is about 0.35×0.12 mm and that of the

duct 1.44×0.06 mm. Säftigen's pouch oval, about 0.7×0.32 mm in size. Muscular cap ca. 0.18×0.32 mm in size, with two elevations in the anterior part, and a penis between them. Bursa copulatrix well developed, 0.41 mm in length. Ovary spherical or oval, 0.15×0.09 mm. Uterus long, uterine bell small.

Eggs $97.5 \times 22.5 \mu$ in size. The middle shell $90.0 \times 21.0 \mu$. Polar swellings not very remarkable, containing granules. The inner shell $60.0 \times 18.0 \mu$ and the embryo $30.0 \times 13.5 \mu$.

Material. Many.

Host. *Hexagrammos otakii* (Jap. name "Kuzime"), intestine. *Teuthis fuscescens* (Jap. name "Aigo"), intestine.

Locality. Hukue-tyô, Aiti Prefecture and Momotori-mura, Sima-gun, Mie Prefecture.

Collector. Morisita.

Longicollum alemniscus
(Harada, 1935)

Fukui et Morisita: Zikken-Igaku-Zasshi (Japanese Journal of Experimental Medicine) Vol. 21, No. 1, pp. 36-41, pl. 1-3, 1937.

Synonym: *Spirorhynchus alemniscus* Harada, 1935.

Longicollum minor
Fukui et Morisita, 1936.

This species was first described by Harada from the marine

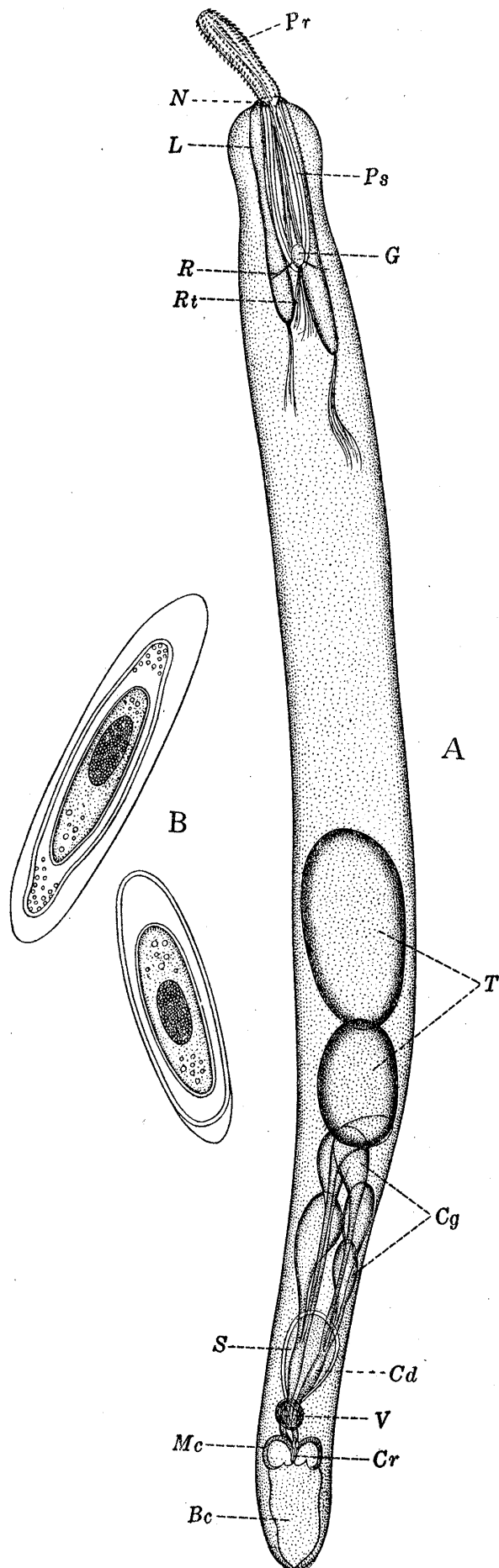


Fig. 3. *Filisoma japonicum* Fukui et Morisita.

A. A male specimen, 8.93 mm long.

B. Eggs. Larger one, $97.6 \times 22.5 \mu$ in size.

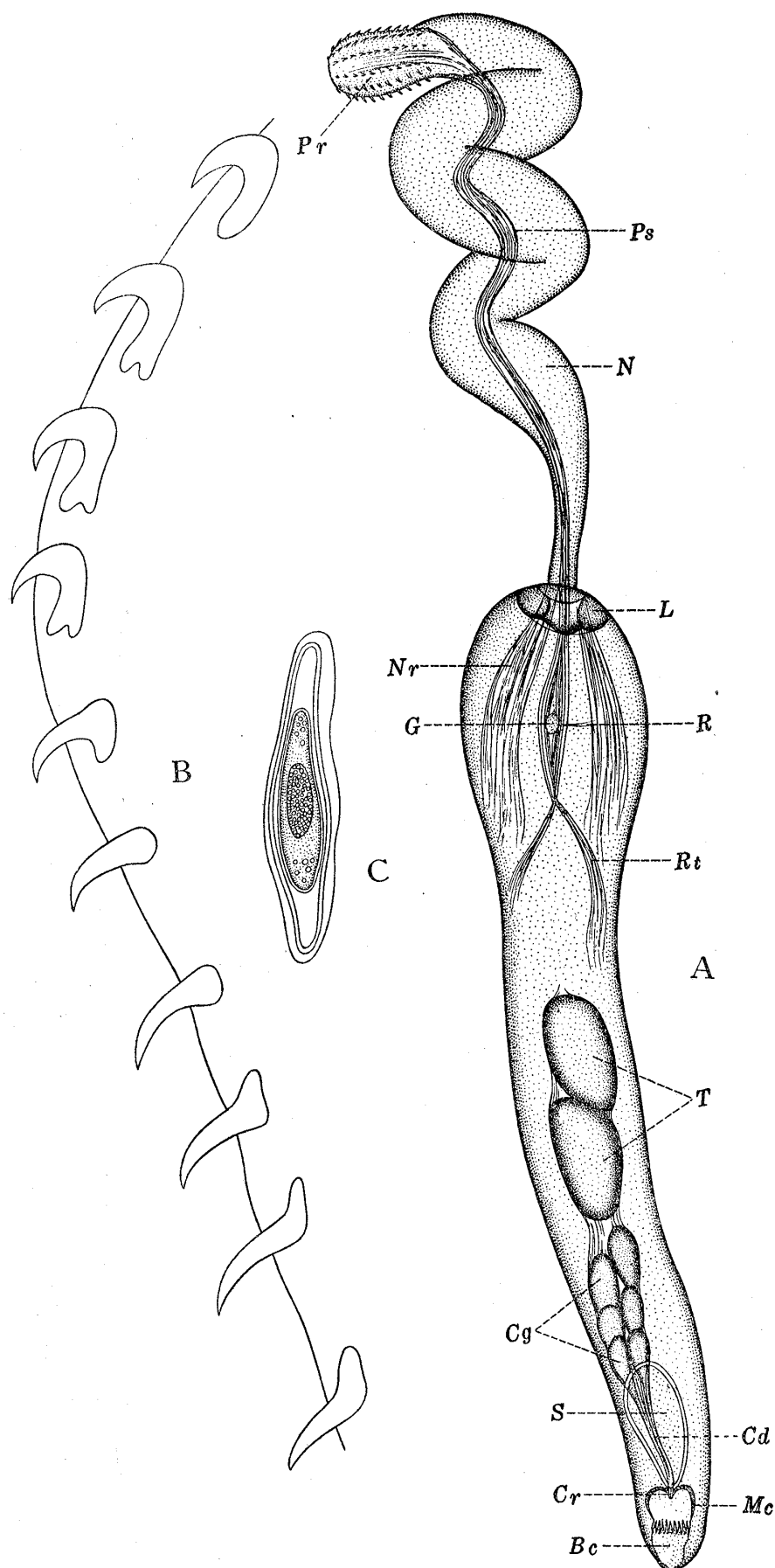


Fig. 4. *Longicollum alemniscus* (Harada).

A. A male specimen, 14.5 mm long. B. A row of proboscis hooks.
C. An egg, 77.0×14.0 μ in size.

fish *Scatophagus argus* and *Lutianus russelli* (Jap. name "Kurohosi-huedai") of Formosa. In 1936 we got many specimens of apparently the same kind from the intestine of a kind of sole-fish at Hukue-tyô, Aiti Prefecture. Since the specimens showed differences from Yamaguti's species *L. pagrosomi* in (1) the trunk being much smaller, (2) the ratio of neck to trunk, and (3) in the shape of the root of hooks, we named it *L. minor*. But later we got ample adult materials from *Sparus maculocephalus* (Jap. name "Kurodai"), and immature ones from *Anguilla japonica* (Jap. name "Unagi"), *Plotosus anguillaris* (Jap. name "Gonzui"), *Parasilurus asotus* (Jap. name "Namazu") and younger individuals of *S. maculocephalus*. Studying these materials we came to the conclusion that our materials were not others than *Spirorhynchus alemniscus* Harada itself. The chief differences are found in the following two points: Our materials have lemnisci though greatly reduced, and the proboscis hooks apparently have roots. The lemnisci are scarcely recognized in younger individuals as Yamaguti stated; and as Harada's materials were small, so it is thinkable that he could not recognize them. The root of the proboscis hooks are rarely recognizable in materials preserved in alcohol or in total preparations. So it is also thinkable that they were overlooked. Considering these points we conclude that the genus *Spirorhynchus* is synonymous with *Longicollum*.

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ABBREVIATIONS USED IN FIGURES

Bc	Bursa copulatrix	Nr	Neck retractor
Cd	Cement duct	Pr	Proboscis
Cg	Cement gland	Ps	Proboscis sheath
Cr	Penis	R	Retinaculum
G	Ganglion	Rt	Ligament
L	Lemniscus	S	Säfftigen's pouch
Mc	Mascular cap	T	Testis
N	Neck	V	Seminal vesicle